That which is claimed is:

1. A process for purification of an olefin stream to obtain a feedstock suitable for formation of olefin polymers using a metallocene catalyst system, which purification process comprises:

providing an impure gaseous mixture comprising at least one olefin of from 2 to about 8 carbon atoms, acetylenic impurities having the same or similar carbon content in an amount of up to about 1 percent by volume based upon the total amount of olefin present and optionally saturated hydrocarbon gases;

passing the impure mixture through a first zone containing a bed of regenerated adsorbent which has retained a substantial amount of carbon monoxide, the adsorbent comprising predominantly a support material having high surface area on which is dispersed at least one metallic element in the zero valent state selected from the group consisting of chromium, iron, cobalt, nickel, copper, ruthenium, palladium, silver and platinum, to effect, under conditions suitable for adsorption within the bed, selective adsorption and/or complexing of the contained acetylenic contaminants with the adsorbent, and thereby obtain an effluent mixture which contains less than about 1 part per million by volume of the acetylenic impurities and an amount of carbon monoxide deleterious to a metallocene catalyst system in formation of olefin polymers; and

contacting the effluent mixture in a second zone containing an adsorbent capable of effecting, under conditions suitable for adsorption within the zone, selective adsorption and/or complexing of the contained carbon monoxide with the adsorbent therein, and thereby obtain a feedstock which contains less than about 5 parts per million by volume of carbon monoxide and less than about 1 parts per million by volume of the acetylenic impurities.

2. The process according to claim 1 wherein the adsorbent in the second zone comprises cations of at least one

element selected from the group consisting of calcium, titanium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, zinc, zirconium, molybdenum, palladium, silver and tin.

3. The process according to claim 1 wherein the adsorbent in the second zone comprises a solid which has surface area in a range of from about 10 to about 2,000 square meters per gram as measured by the BET gas adsorption method.

4. The process according to claim 3 wherein the metallic element dispersed on the support material in the first zone is at least one element selected from the group consisting of iron, cobalt, nickel, copper, palladium, silver and platinum, and the regenerated absorbent has a dispersed metal content in a range of from about 0.01 to about 10 percent based on the total weight of the adsorbent.

5. The process according to claim 4 wherein the gaseous mixtures pass though the beds of adsorbent at gas hourly space velocities in a range of from about 0.05 $hours^{-1}$ to about 20,000 $hours^{-1}$ measured at standard conditions of 0°C and 760 mm Hg.

6. The process according to claim 1 wherein the adsorbent in the second zone comprises at least one compound selected from the group consisting of calcium carbonate, manganese oxide, oxides of cobalt(II), (III) and (II/III), copper(I) chloride, copper(II) chloride, copper(I) oxide, copper(II) oxide, tin(II) chloride, tin(IV) chloride, palladium chloride, silver nitrate, and zinc oxide.

7. The process according to claim 6 regenerated adsorbent in the first zone comprises at least about 90 weight percent of a gamma alumina having surface area in a range of from about 80 to about 500 square meters per gram as measured by the BET gas adsorption method, the metallic element dispersed on the alumina is palladium, and the absorbent has a palladium content in a range of from about 0.01 to about 10 percent based on the total weight of the adsorbent.

8. The process according to claim 1 wherein the regenerated adsorbent in the first zone comprises at least about 90 weight percent of a gamma alumina having surface area in a range of from about 150 to about 350 square meters per gram as measured by the BET gas adsorption method, the metallic element dispersed on the support material is palladium, and the absorbent has a palladium content in a range of from about 0.01 to about 10 percent based on the total weight of the adsorbent.

9. The process according to claim 8 wherein the adsorbent in the second zone is a solid and comprises cations of copper.

10. A process for purification of olefins produced by thermal cracking of hydrocarbons to obtain a feedstock suitable for formation of olefin polymers using a metallocene catalyst system, which purification process comprises:

providing an impure gaseous mixture comprising at least about 99 percent by volume of an olefin having from 2 to about 4 carbon atoms, and acetylenic impurities having the same or similar carbon content in an amount in a range upward from about 1 to about 1000 parts per million by volume based upon the total amount of olefin present and optionally saturated hydrocarbon gases;

passing the impure mixture through a first zone containing a bed of regenerated adsorbent which has retained a substantial amount of carbon monoxide, the adsorbent comprising predominantly a support material selected from the group alumina, silica, active carbon, clay and zeolites having surface area in a range of from about 10 to about 2,000 square meters per gram as measured by the BET gas adsorption method, on which is dispersed at least one metallic element in the zero valent state selected from the group consisting of chromium, iron, cobalt, nickel, copper, ruthenium, palladium, silver and platinum, to effect, under conditions suitable for adsorption within the bed, selective adsorption and/or complexing of the contained acetylenic contaminants with the adsorbent, and thereby obtain an effluent mixture which contains less than about 1 part per

million by volume of the acetylenic impurities and an amount of carbon monoxide in a range upward from about 10 parts per million by volume; and

passing the effluent mixture through a second zone containing a bed of adsorbent which comprises at least one metallic element in a positive valent state selected from the group consisting of calcium, titanium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, zinc, zirconium, molybdenum, palladium, silver and tin, to effect, under conditions suitable for adsorption within the zone, selective adsorption and/or complexing of the contained carbon monoxide with the adsorbent therein, and thereby obtain a feedstock which contains less than about 5 parts per million by volume of carbon monoxide and less than about 1 parts per million by volume of the acetylenic impurities.

11. The process according to claim 10 wherein the adsorbent in the second zone comprises an oxide of at least one element selected from the group consisting of manganese, cobalt, copper, and zinc.

12. The process according to claim 11 wherein the gaseous mixture passes though the beds of adsorbent at space velocities in a range of from about 0.05 hours^{-1} to about 20,000 hours^{-1} measured at standard conditions of 0°C and 760 mm Hg

13. The process according to claim 11 wherein the adsorbent in the first zone comprises at least about 90 weight percent of a gamma alumina having surface area in a range of from about 80 to about 500 square meters per gram as measured by the BET gas adsorption method, and contains less than 500 parts per million by weight of a sulfur-containing component, calculated as elemental sulfur.

14. process according to claim 10 wherein the adsorbent in the second zone comprises at least one compound selected from the group consisting of calcium carbonate, manganese oxide, oxides of cobalt(II), (III) and (II/III), copper(I) chloride,

copper(II) chloride, copper(I) oxide, copper(II) oxide, tin(II) chloride, tin(IV) chloride, palladium chloride, silver nitrate, and zinc oxide.

15. The process according to claim 10 wherein the adsorbent in the second zone comprises cations of copper.

16. The process according to claim 15 wherein the metal dispersed on the support material in the first zone is palladium, and the absorbent has a palladium content in a range of from about 0.01 to about 10 percent based on the total weight of the adsorbent.

17. The process according to claim 10 wherein the olefin in the gaseous mixture being purified is predominantly ethylene or propylene, wherein the adsorbent in the first zone has a metal dispersion value in a range upward from about 20 percent to about 80 percent as measured by carbon monoxide chemisorption method, and wherein the gaseous mixture, while passing through the bed in the first zone, is at temperatures in a range of from about 35°C to about 65°C

18. A process for purification of a gaseous mixture to obtain a feedstock suitable for formation of polymer using a metallocene catalyst system, which purification process comprises:

providing an impure gaseous mixture comprising at least about 99 percent by volume of ethylene, and acetylene in an amount in a range upward from about 1 to about 1000 parts per million by volume based upon the total amount of ethylene present and optionally saturated hydrocarbon gases;

passing the impure mixture through a first zone containing a bed of adsorbent which has retained a substantial amount of carbon monoxide, the adsorbent comprising at least about 90 weight percent of gamma alumina having surface area in a range of from about 150 to about 350 square meters per gram as measured by the BET gas adsorption method, on which is dispersed palladium in the zero valent state, to effect, under

conditions suitable for adsorption within the bed, selective adsorption and/or complexing of the contained acetylene contaminant with the adsorbent, and thereby obtain an effluent mixture which contains less than about 1 part per million by volume of acetylene and an amount of carbon monoxide in a range upward from about 10 parts per million by volume;

passing the effluent mixture through a second zone containing a bed of adsorbent which comprises at least one metallic element in a positive valent state selected from the group consisting of calcium, titanium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, zinc, zirconium, molybdenum, palladium, silver and tin, to effect, under conditions suitable for adsorption within the zone, selective adsorption and/or complexing of the contained carbon monoxide with the adsorbent therein, thereby obtain a feedstock which contains less than about 5 parts per million by volume of carbon monoxide and less than about 1 parts per million by volume of acetylene;

effecting, in the presence of an essentially dihydrogen-free atmosphere within the bed in the first zone, selective adsorption and/or complexing of the contained acetylene with the adsorbent, until levels of acetylene in the effluent mixture increase to a limiting level in a range downward from about 1 parts per million by volume; and

thereafter regenerating the resulting bed of adsorbent in the first zone in the presence of a reducing gas comprising dihydrogen and containing at least 50 parts per million of carbon monoxide, to effect release of the contained acetylene from the adsorbent.

19. The process according to claim 18 wherein the adsorbent in the second zone comprises copper(I).

20. The process according to claim 19 wherein the adsorbent in the first zone contains less than 500 parts per million by weight of a sulfur-containing component, calculated as elemental sulfur, and the absorbent in the first zone has a palladium content in a range of from about 0.01 to about 10 percent based on the total weight of the adsorbent.